HAWAII DEEP WATER CABLE PROGRAM

PHASE II

REASSESSMENT OF
CABLE VESSEL AVAILABILITY

Prepared by

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Prepared for

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U.S. Department of Energy

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HAWAII DEEP WATER CABLE DEMONSTRATION PROGRAM

REASSESSMENT OF CABLE VESSEL AVAILABILITY

Ref: "Preliminary Cable Vessel Ship Inventory and Capabilities"
MGA Report Dated 26 March 1982

I. Background

The referenced report summarized a survey of existing cable vessels to determine their applicability and availability to the HDWC Program. This report concluded that none of the existing vessels were applicable to the program without major modifications to the cable handling equipment.

In addition, it was unclear that any of the candidate cable vessels would be available for the cable laying operation schedule for March 1985.

The report further recommended that the FOSS 286 barge be outfitted with the necessary equipment and used as the cable vessel. A conceptual design and cost estimate for this approach was prepared.

As a result of technical discussions with Parsons, HECO and DOE, HD&C was requested to reassess the applicability and availability of the most likely candidate cable vessels. The following sections discuss the latest work.

II. Reassessment

On March 8, 1983, Morris Guralnick Associates, Inc. was tasked with updating the vessel availability portion of Ref

1. This effort resulted in the March 23, 1983 (MGA report), which is attached as Appendix A.

Representatives for Parsons, Simplex, HD&C met with MGA in San Francisco on April 4, 1983 to review the report. The results of the meeting concluded that the vessels APACHE, SKAGERRAK, FOSS 286 and the SUSITNA were potential candidates for the program's cable vessel. Although the MGA March 82 report suggested the APACHE and SKAGERRAK might not be available for the program, the latest information indicate they could be available. The SUSITNA was not identified in the March 82 report and its addition to the list of candidates resulted from discussions with Mr. Schoephoester of Northern Offshore. The SUSITNA has been used to lay high voltage cable in Alaska.

Appendix B is a summary of required modifications to the candidate vessels for the range of cable characteristics specified by Simplex.

III. Cable Vessel Proposals

Subsequent to the April 4 meeting, Parsons and HD&C concluded it would be more efficient and cost effective for HD&C to directly contact the candidate cable vessel owners and continue the effort initiated by MGA.

HD&C prepared and submitted an RFP, Appendix C, to the candidate cable vessels, and received replies from Santa Fe Engineering (Appendix D), Pirelli Cable Corporation (Appendix E), and Chugach Electric (Appendix F). Although the Chugach reply expressed interest in providing the

SUSITNA for the program, no cost or technical data was provided.

Table 1 is a summary of the pertinent cost data extracted from Appendix D, E and the MGA report which proposed the use of the FOSS 286 barge.

IV. Evaluation of Proposals

The criteria upon which the cable vessel proposals are evaluated is (from Appendix C):

1) Ability of vessel to perform the cable laying operation safely in sea state specified.
2) Cost and cost sharing.
3) Ability to commit vessel for deployment in early 1985.
4) Other terms and conditions.

Comments

1) Santa Fe and Pirelli indicate that the vessels proposed are capable of the cable laying operation in the sea state specified.
2) None of the proposers offered any cost sharing.
3) The APACHE is available in the timeframe of early 1985, however, a significant increase in cost results if the vessel is used after February 15, 1985 ($7,927,000 vs. $14,787,000). The time estimates developed for the program and the estimate provided by Pirelli do not support the possibility of completing the cable laying operation prior to February 15, 1985. Therefore, the higher value will be used for comparison. This large cost increase results from the fact that APACHE's prime business starts after February when sea conditions

TABLE 1
SUMMARY OF RFP RESPONSES

	Santa Fe		Pirelli					MGA
	APACHE		SUSITNA	H.P. LADING	APACHE	A.D. 7	SKAGERRAK	FOSS 286
Task 1 Design/Procurement Fab/Test Laying Equipt.	3,500,000 Note 3		3,500,000 Note 2	3,500,000 Note 2	3,500,000 Note 2	3,500,000 Note 2	3,500,000 Note 2	6,387,000 Note 4
Task 2 Mob/Demob Prior 2/15/85	1,335,000							
After 2/15/85	3,485,000		13,000,000 Note 1	8,000,000 Note 1	20,000,000	5,000,000 Note 1	10,000,000	
Task 3 Cable Laying/Ret Operation Prior 2/15/85	2,930,000							
After 2/15/85	7,640,000							4,435,000 Note 1
Task 4 Other Services Radio Navigation	12,000		12,000	12,000	12,000	12,000	12,000	
Misc.	150,000		150,000	150,000	150,000	150,000	150,000	
TOTAL	7,927,000	2/14/85	13,512,000	11,662,000	23,662,000	8,662,000	13,662,000	10,822,000
	14,787,000	2/15/85						

Note 1. Includes the cost of tugs.
Note 2. Includes primarily tensioning equipment turntable, overboard sheave.
Note 3. Santa Fe response did not consider the need for linear tensioning, therefore 3.5M is used to be consistent with Pirelli response.
Note 4. MGA estimated cost for equipment is based on moderate cable tensioning loads - similar to Pirelli/Santa Fe basis In addition, MGA costs provide for auxiliary marine equipment in addition to cable handling equipment.

improve. Prior to that time, APACHE is essentially in a standby mode and therefore can offer a reduced cost.

4) Pirelli provided cost data on five vessels (including the APACHE); however, additional effort is required to determine availability of the vessels. Pirelli recommended the A.D. 7 (Italy) as the cable laying vessel for technical and economic reasons (estimated cost $8,662,000).

5) The FOSS 286 costs are the same as reported in the March 82 report. No effort was expended to update these estimates, since no significant change in equipment or requirements were identified. Additionally, the owners of the 286 were requested to propose on the use of the barge, however, they offered to support the program but did not provide any cost estimates.

6) The vessels under consideration fall into two broad categories as follows:

Self-Propelled	Non Self-Propelled
APACHE	SUSITNA
SKAGERRAK	H.P. LADING
	A.D. 7
	FOSS 286

Another factor that must be weighed in before a final selection can be made is the required maneuverability and controllability and how well any candidate vessel can meet these requirements. The self-propelled vessels have the advantage of following a predetermined

track with relative small deviations when compared to the non self-propelled vessels. However, a requirement for such close tracking has not been identified. Additional analysis on the requirements for stationkeeping will be necessary to resolve this matter.

7) A reduction in cost would be realized if the sea trial site were closer to the cable manufacturers plant. However, it is unlikely that the combination of bottom profile and depth, sea and wind conditions, and currents, could be located at sites other than the Alenuihaha Channel. Duplicating these conditions is important since each element contributes to the cablelaying/retrieving equipment design, and cable vessel requirements.

Conclusion

The ranking of cable vessels based on cost is:

1)	A.D. 7	$ 8,662,000
2)	FOSS 286	10,822,000
3)	H.P. LADING	11,662,000
4)	SUSITNA	13,512,00
5)	SKAGERRAK	13,662,000
6)	APACHE	14,787,000

It appears that the A.D. 7, recommended by Pirelli, could represent a significant savings ($2.2M) over the FOSS 286 proposal by MGA. Additionally, the A.D. 7 has been used for cable laying operations in opean ocean environment and should provide greater assurance of a successful deployment.

Before any firm conclusion can be reached, however, it will be necessary to confirm the cost estimate, the availability of the A.D. 7, review data supporting its ability to operate in the Alenuihaha Channel, and obtain more data regarding its design. Since the A.D. 7 is a foreign vessel, it will also be necessary to confirm there are no legal barriers to use the vessel on a Federally-funded project.

MORRIS GURALNICK ASSOCIATES, INC.
NAVAL ARCHITECTS MARINE ENGINEERS

REPORT ON
CABLE SHIP AVAILABILITIES

Prepared by
MORRIS GURALNICK ASSOCIATES, INC.

for
HAWAIIAN DREDGING AND CONSTRUCTION CO.
1580 Makaloa Street
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March 23, 1983

APPENDIX A

I. Introduction

This report has been developed in preparation for Phase II of the Hawaii Deep Water Electrical Transmission Cable (HDWC) Demonstration Program. Its purpose is to update the vessel availability portion of the "Preliminary Cable Ship Inventory and Capabilities" report dated 29 January 1982 which was prepared as part of the Phase I effort.

Vessel owners/operators were contacted to discuss present and future committments for their vessels through mid 1985. The late '84 - mid '85 period was emphasized since it is felt that this time frame will be required to cover vessel acquisition and modification, cable transport, cable deployment and retrieval, and vessel demobilization to meet the July 31, 1985 end date.

The results of the availability survey are provided in the following sections.

II. U.S. Flag Vessels

A. U.S. Government

1) Vessels - USNS ZEUS
USNS ALBERT J. MYER
USNS NEPTUNE
USNS AEOLUS

2) Person Contacted - Mr. Jim Coleman
NAVELEX PME 124
Washington, DC
(202) 692-8820

3) Vessel Schedules

The MYER, NEPTUNE and AEOLUS are currently operating for U.S. Government communication cable laying operations and the ZEUS is scheduled for delivery in January, 1984. Exact schedules for the vessels are classified and therefore

cannot be released without proper authorization. Mr. Coleman did say, however, that all of the vessels are fully committed throughout the '84-'85 time frame.

Based on a brief description of the power cable and the project, Mr. Coleman voiced the opinion that it would not be economically feasible to convert any of the government cable ships for this project. He sited the lack of deck space to provide stowage for a reel or turntable and the need to provide much larger overboarding sheaves as two problems that would be expensive to overcome. He also voiced the opinion that the Navy may be reluctant to commit a vessel to a shipyard conversion in view of the delays and other experiences they encountered in recent conversion projects of their own.

B. Santa Fe Engineering and Construction Co.

1) Vessels - APACHE
CHICKASAW

2) Person Contacted - Mr. Bob Warren
Santa Fe Engineering and Construction Co.
Orange, CA
(714) 558-1300

3) Vessel Schedules

The APACHE is normally assigned to the North Sea for pipelaying operations in the summer months (May - September) and is idle during the winter (October - April) unless special projects can be found. They have no firm committment for '84 or '85 although they are currently bidding work for the summer of '84.

The CHICKASAW is normally assigned to the Gulf Coast region for pipelaying operations. They currently have no plans for this vessel for either '84 or '85.

He felt that either vessel could be adapted to the needs of the program and that the APACHE would be the better candidate of the two. He stated that they normally charter the APACHE at about half the daily rate during the winter months since she would otherwise be idle.

As a less espensive alternative, Mr. Warren said that Santa Fe also has portable reels which could be mounted on the deck of a barge or supply vessel for short term cable laying operations.

C. Transoceanic Cable Ship Co. (AT&T)

1) Vessel - LONG LINES
SALERNUM

2) Person Contacted - Mr. Vince Tomalonis
Transoceanic Cable Ship Co.
Morris Township, NJ
(201) 326-4410

3) Vessel Schedule

The C/S LONG LINES is currently completing transatlantic TAT-7 and will enter the shipyard about May for a one month maintenance period. The remainder of '83 will be spent on cable guard duty out of its North Carolina base.

In 1984, the ship is tentatively scheduled for U.S. Navy work in the Pacific for the 2nd and 3rd quarters, but no firm committments have been made. It is firmly scheduled for work on a fibre optics system to the Canary Islands during the last quarter of '84 and extending into early '85. Beyond that, nothing is scheduled until the next transatlantic lay in 1988.

As a point of interest, Mr. Tomalonis stated that Transoceanic is going to purchase the Italian cable ship

SALERNUM and convert it to American flag and crew. (Data sheets on this vessel are attached). It will then be based in Hawaii by late '84 or early '85 to replace the CABLE ENTERPRISE on Pacific cable repair duty.

Although this vessel as configured could not meet the HDWC requirements, it has been modified temporarily in the past by the Italians to lay power cable.

III Foreign Vessels

A. COFLEXIP

1) Vessels - FLEXSERVICE 1
FLEXSERVICE 2
FLEXSERVICE 3
STAD - FLEX

2) Person Contacted - Mr. Phillipe De Panafieu
COFLEXIP
23 Avenue Neuilly
75116 Paris, France
011-33-1-747-11-42

3) Vessel Schedules

The FLEXSERVICE 1 is currently operating off Brazil for PETROBRAS. They have firm contracts for this vessel through 1984, with an option for 1985. These committments would appear to rule out this vessel as a viable candidate.

Mr. De Panafieu felt that any one of the other three vessels operated by Coflexip could be converted for the HDWC program. The FLEXSERVICE 2 is currently in the Arabian Gulf and is contracted through May of 1984. They have no firm or potential committments beyond that time. The FLEX-SERVICE 3 is currently operating between Europe and the Middle East. However, this vessel is under contract to

Electricité de France (EDF) to lay power cables between France and England during July and August of both 1984 and 1985. Hence it would not be available for the HDWC time frame.

The STAD - FLEX is currently working in the Mediterranean off Europe and has no firm committments for 1984 or '85.

COFLEXIP also has available a series of portable reels for use on other vessels.

B. Standard Telephon og Kabelfabrik A/S (STK)

1) Vessel - C/V SKAGERRAK

2) Person Contacted - Mr. O.I. Gilbertson
STK
591 Camino de la Reina
San Diego, CA
(619) 295-5181

3) Vessel Schedule

The vessel is currently under contract to the British Columbia Hydro and Power Authority to lay power cables between the mainland and Vancouver Island, British Columbia. This project is expected to be completed in November, 1983.

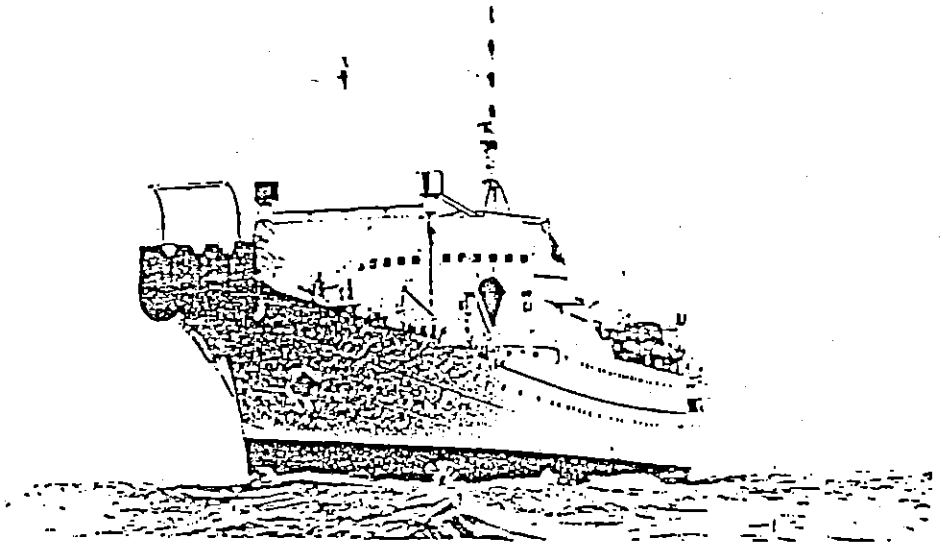
There are no firm committments for the vessel beyond that time although they are negotiating for a project that would take approximately 3 months during the summer of 1984.

Mr. Gilbertson stated that the ship's present capability is limited to approximately 50 metric tons line pull and that the maximum required for the Vancouver project is 32 tons. Thus some modification would be required for the HDWC project as configured. He also emphasized that the availability of the vessel would be dependent upon setting a firm schedule as soon as possible and making some committments to STK to hold that time slot.

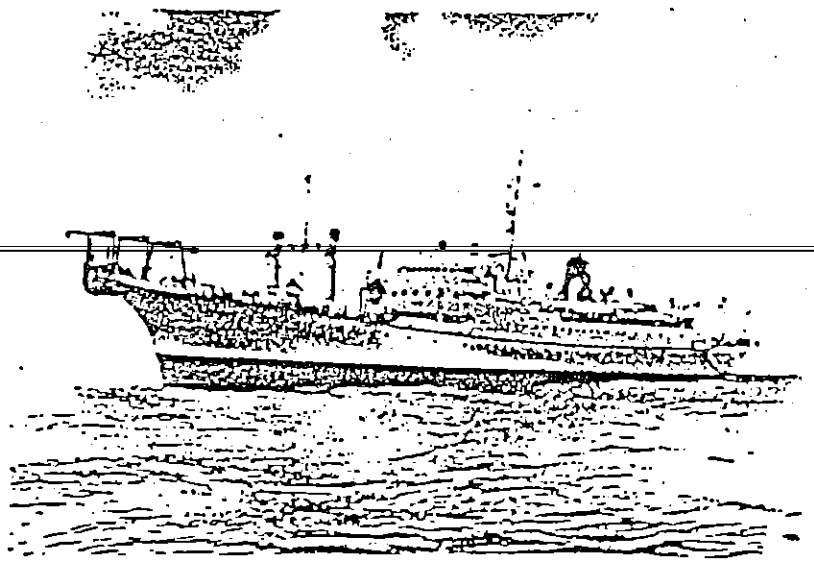
Reference numbers	Lloyd's: 5307738
	ABS: 5402623 R.I. No. 20751
Flag	Italy
Designer	Prof. Ernesto Fasano, N. A.
Builder	see remarks
Date laid down	1952
Laid down as what	cableship
Date launched	1953
Date commissioned	1954
Date converted	-
Converted from what	-
Functions	cable laying and repair
Base	Naples
Operating areas	all oceans
Length over all	339.6 feet
Between perpendiculars	299.5
Extreme breadth	41.4
Molded breadth	41.3
Molded depth	19.4
Gross register tonnage	2834
Net register tonnage	1032
Underdeck tonnage	2295
Deadweight	2165 tons
Displacement loaded	4380
Displacement light	2135
Draft full load	18.8 feet
Draft light	13.1
Stabilization, type(s)	none
Metacentric ht., full load	2.6 feet
Main propulsion type	see remarks
Horsepower	3500
Number of screws	2
Number of rudders	1
Type of rudder(s)	balanced spade
Type of forward maneuvering unit	none
Horsepower	-
Thrust	-
Directions	-
Type of after maneuvering unit	none
Horsepower	-
Thrust	-
Directions	-
Maneuvering controls	-
Location(s)	-
Integration	-
Cruising speed	14 knots
Maximum speed	15
Number of bow sheaves	3
Bow sheave diameter	10 feet

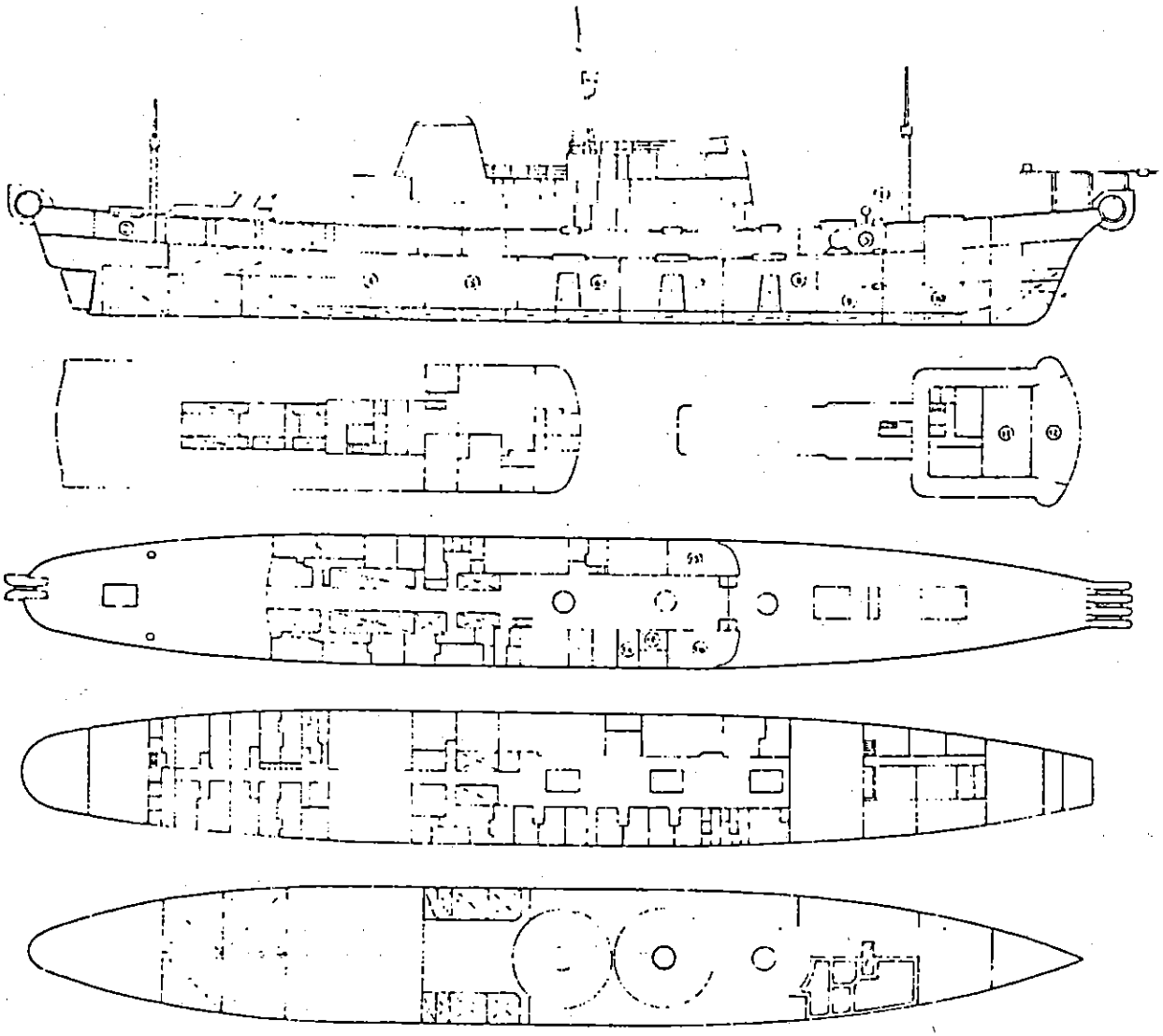
Number of drums fwd.	2
Diameter	10.0 feet
Type of drive	electric
Force	36 7 4 tons
at what speed	0.5 3 8 knots
Type of fleeting	hydraulic knives
Type of drawoff gear	sheave and jockey
Effective diameter	4.9 feet
After cable engine type	none
Diameter of drum	-
Type of drive	-
Force	-
at what speed	-
Type of fleeting	-
If no after gear, method of payout aft	uses forward drums
Stern sheave or chute	sheave
Effective diameter	6.8 feet
Plow handling device	none
Ship's bollard pull	35 tons
Mast height above keel	98.5 feet
No. of main cable tanks	3
Coiling capacity	23,307 cubic feet
No. of spare cable tanks	none
Coiling capacity	-
Allowable cable and repeater deadweight	1800 tons
Number of cable pans that can be loaded	none
Coiling capacity each	-
Weight each	-
Repeater stowage method and location	racks, in hangar, upper deck, way of tank hatches
Capacity of bunkers	382 tons
Rate of use, cruising	15 tons per day
working	5
in port	2
Range at cruising speed	7000 nm
Fresh water capacity	200 tons
potable	200
boiler	-
Evaporator capacity	12 tons per day
Number of persons that can be berthed	110
as crew	92
as other	18
Number of single cabins	6
Testroom adequacy for repairs	5 (score 0-5)
laying	5
Remarks	

Owned and operated by Fratelli d'Amico Armatori. Built by Cantiere Navale Navalmeccanica, Castellammare di Stabia, Naples. Propulsion diesel-electric, or geared diesel for passage. Class +A1 E +AMS; also LR and RI.



SALERNUM in 1954, and below,
after fitting of bow gantry in 1957





1 dynamometer
2 hold No. 3
3 cable engine
4 engine room
5 generator room
6 No. 3 cable tank
7 No. 2 cable tank
8 No. 1 cable tank
9 hold No. 2
10 hold No. 1
11 chart room
12 wheelhouse
13 drum room
14 laboratory
15 high voltage room
16 electrical test room

General Arrangement, SALERNUM

CABLE VESSEL REQUIREMENTS FOR THREE POTENTIAL
HDWC DEMONSTRATION CABLES

Cable Vessel Requirements	Cable Designation Per Simplex 4/12/83 Letter Low - 4.9" O.D.	Med. - 5.4" O.D.	High - 6.0" O.D.
Reel/Turntable Capacity - LBS	420,000	620,000	820,000
Reel/Turntable Min. Hub Dia. - FT	13.0	16.0	16.0
Overboarding Sheave Min. Dia. - FT	33.0	39.0	45.0
Cable Drum Min. Dia. - FT	33.0	39.0	45.0
Max Design Tension During Deployment & Retrieval - LBS	127,000	209,000	282,000
Max Rating for Tensioning Equipment (Design Tension ÷ 0.65) - LBS	195,000	322,000	434,000
Number of 10 Tonne * Linear Machines Read for Full Tension	9	15	20

* ~~Overall Dimensions 4960 mm x 1240 mm x 2340 mm. (16.5'L x 4'W x 7.8'H)~~
10 tonne Brondel machine was selected by MGA because it represented the largest state-of-the-art least cost cable tensioning machine available at the time.

C/S SKAGERRAK
REQUIRED MODIFICATIONS FOR
THREE POTENTIAL CABLE SIZES

Vessel Requirement	Cable Designation Low - 4.9" O.D.	Med. - 5.4" O.D.	High - 6.0" O.D.
Turntable			
Exist. Load Cap. 7000 t.			
Mods Required	None	None	None
Exist. Hub Dia. - 39 FT			
Mods Required	None	None	None
Overboarding Sheave			
Exist. Dia. - 32.8 FT			
Mods Required	None	Increase to 39 FT	Increase to 45 FT
Cable Drum			
Exist Dia. - 32.8 FT			
Max Tension for this Dia = 225,000#			
Mods Required	None	Increase to 39 FT	Increase to 45 FT
Tensioning Capability			
Drum - 77,000#			
Linear - 19,000#			
Total 96,000#			
Mods Required	Add 5-10 tonne linear machines OR Increase drum cap. by 99,000#	Add 11-10 tonne linear machines OR Increase drum cap. by 148,000 and add 4-10 tonne linear machines	Add 16-10 tonne linear machines OR Increase drum cap. by 148,000 and add 9-10 tonn linear machines
Accomodations			
Exist. Manning	None	None	None
Navigation Equipment	Exist. Equip. is Adequate for HDWC		
Propulsion			
Exist. - 7200 HP			
Mods Required	None	None	None
Maneuvering			
Exist. - 1320 HP Thruster			
Mods Required	None	None	None
Other Mods Required	None	None	None

APACHE
REQUIRED MODIFICATIONS FOR
THREE POTENTIAL CABLE SIZES

Vessel Requirement	Cable Designation Low - 4.9" O.D.	Med. - 5.4" O.D.	High - 6.0" O.D.
Reel			
Exist. Load Cap. 2000 t.			
Mods Required	None	None	None
Exist. Hub Dia. - 54 FT			
Mods Required	None	None	None
Overboarding Sheave			
Exist. - None			
Mods Required	New 33' Dia.	New 39' Dia.	New 45' Dia.
Cable Drum			
Reel Provides 200,000# Tensioning	Per telecon w/Simplex 4/19/83 - Main reel should not be used for storage and tensioning.		
Tensioning Capability			
Reel - 200,000#			
Linear- 80,000#	Provide 6-10 tonne	Provide 11-10 tonne	Provide 16-10 tonne
Total 280,000#	linear machines	linear machines	linear machines
Mods Required	(or a combination of new cable drum & linear machine)		
Accommodations			
Exist. Crew - 123			
Mods Required	None	None	None
Navigation Equipment	Exist. Equip. is Adequate for HDWC		
Propulsion			
Exist. - 7200 SHP			
Mods Required	None	None	None
Maneuvering			
Exist. 4 Thrusters @ 800 HP Ea.			
Mods Required	None	None	None
Other Mods Required	None	None	None

FOSS 286
REQUIRED MODIFICATIONS FOR
THREE POTENTIAL CABLE SIZES

Vessel Requirement	Cable Designation Low - 4.9" O.D.	Med. - 5.4" O.D.	High - 6.0" O.D.
Turntable			
Exist. - None			
Mods Required	New 420,000# Cap.	New 620,000# Cap.	New 820,000# Cap.
Exist. Hub Dia. - None			
Mods Required	New 13' Dia.	New 16' Dia.	New 16' Dia.
Overboarding Sheave			
Exist. - None			
Mods Required	New 33' Dia.	New 39' Dia.	New 45' Dia.
Cable Drum			
Exist. - None			
Mods Required	None - Use Linear Hauler		
Tensioning Capability			
Exist. - None			
Mods Required	Add 9-10 tonne linear machines	Add 15-10 tonne linear machines	Add 20-10 tonne linear machines
	(or a combination of new cable drum & linear machine)		
Accommodations			
Exist. - None			
Mods Required	Temporary Accommodations for 15 People No Overnight Berthing Required		
Navigation Equipment			
Exist. - None	Add positioning system, radios - min.		
Mods Required	required to supplement equipment on tugs		
Propulsion			
Exist. - None			
Mods Required	To Be Provided With Tugs 2 Tugs @ 3600 SHP Each		
Maneuvering			
Exist. - None			
Mods Required	To Be Provided With Tugs		
Other Mods Required	Lifesaving Equipment, Power for Linear Haulers Power for Misc. Services, Fuel Tank(s)		

SUSITNA
REQUIRED MODIFICATIONS FOR
THREE POTENTIAL CABLE SIZES

Vessel Requirement	Cable Designation Low - 4.9" O.D.	Med. - 5.4" O.D.	High - 6.0" O.D.
Turntable			
Exist. Load Cap. - 400 T. = 896,000#			
Mods Required	None	None	None
Exist. Hub Dia. - 19 FT			
Mods Required	None	None	None
Overboarding Sheave			
Exist. - Trough Midships Stbd.			
Mods Required	New 33' Dia.	New 39' Dia.	New 45' Dia.
Cable Drum			
Exist. - None			
Mods Required	None - Provide linear handlers	None - Provide linear handlers	None - Provide linear handlers
Tensioning Capability			
Mods Required			
Accommodations			
Exist. Crew - 26			
Mods Required	None	None	None
Navigation Equipment			
Exist. - None			
Mods Required			
Propulsion			
Exist. - None			
Mods Required		To be Provided with Tugs 2 Tugs @ 3600 HP Each	
Maneuvering			
Exist. - None			
Mods Required		To be Provided with Tugs	
Others Mods Required			

Hawaiian Dredging & Construction Company

HAWAII DEEP WATER CABLE DEMONSTRATION PROGRAM

Request for Proposal

A. Introduction

The Hawaii Deep Water Cable (HDWC) Demonstration Program is a Department of Energy and State of Hawaii sponsored R&D project dedicated to the development of a high voltage DC cable that can be laid in the deep open ocean waters from the Island of Hawaii to the Island of Oahu in the Hawaiian chain. This program is being developed in anticipation of large quantities of excess electrical power being produced by geothermal energy on the Island of Hawaii which can be used on the heavily populated Island of Oahu.

In addition to the R&D associated with developing the underwater cable, there are two other major elements of the program:

1) Bathymetrical surveys to select the routing of the cable and,
2) Outfitting a cable laying vessel capable of handling large loads associated with weight of the cable in 7000 ft. of water and the environmental loads due to currents, waves and wind.

Hawaiian Dredging & Construction Company is the principal subcontractor responsible for the selecting and outfitting of the cable laying vessel.

A survey conducted by Morris Guralnick & Associates, Inc., to determine the capabilities of existing cable laying vessels has concluded that no vessel currently has the capability of handling the loads associated with the HDWC although there are candidates which could be modified for the service.

To further investigate the possible candidates, HD&C is soliciting proposals for the modification and use of these vessels for laying 20,000 ft. of the HDWC in mid-1985.

B. Instructions to Proposers

1) The logistic and load requirements for the vessel are outlined in paragraph C below.

2) The proposer is to include all costs including management coordination, design, modification, transit, operation, and overhead and profit.

3) The U.S. Department of Energy believes the owners of the selected vessel will greatly benefit from the upgrading and experience gained in laying the demonstration cable. It is hoped that proposers would explore the possibility of cost sharing.

4) HD&C plans to select only one vessel for further negotiations. If more than one proposal is attractive, HD&C will conduct a further screening effort.

5) The cost of preparing and presenting the proposal will not be reimbursed.

6) Presently, the precise characteristics of the cable are not defined. However, it is expected that the

characteristics will be within the range specified in Paragraph C. The proposer is to indicate the maximum condition of cable weight, size, length, or vessel loads that his vessel can handle after modification.

7) HD&C prefers a negotiated fixed price contract for the design, modification and transiting tasks and a day rate for the cable laying phase.

8) Proposer to include the following costs:

   a) Equipment and vessel modification: design, procurement, fabrication, agency approvals

   b) Seakeeping study and dynamic analysis of cable during laying

   c) Equipment and vessel testing

   d) Equipment removal and reconversion (if required)

   e) Vessel transit: home port to conversion yard, conversion yard to East Coast to pick up cable (assume 7 days cable loading time), East Coast to Honolulu, Hawaii, for deployment, transit to Kawaihae Harbor, Hawaii

   f) Other vessels required for logistic support, transiting and/or stationkeeping

   g) Crew costs

   h) Assume at sea deployment time:

      24 hrs. Honolulu to Kawaihae Harbor, Hawaii

      12 hrs. Preparation

       6 hrs. Laying cable

       6 hrs. Holding

12 hrs. Retrieve cable

24 hrs. Return to Honolulu

9) The requirements and conditions noted in this solicitation are to be treated as preliminary.

10) Each proposal should explicitly address the ability to perform the cable laying and retrieval in the sea state noted in paragraph C.

11) Identify services and equipment required to be supplied by others.

12) Proposer should provide sufficient information describing the program elements and the related cost including locations where the work will be performed.

C. Outline of Cable Vessel Requirements

1) Cable characteristic:

Length: 20,000 ft.: Demonstration section

(Unknown) : Permanent cable longest section

	Cable Weight		
	Low	Moderate	High
Outside Diameter (in.)	4.9	5.4	6.0
Weight in Air (lb./ft.)	21	31	41
Weight in Seawater (lb./ft.)	13	22	30
Max. Install. Tension (lb.)	127,000	209,000	282,000
Min. Untensioned Bend Radius (ft.)	6.5	8	8
Min. Bend Radius During Install. (ft.)	16.5	19.5	22.5

2) The following data represents the preliminary wind, wave and current design criteria:

Wind : 35 knots

Sea Waves : Significant Wave Height H_s = 8 ft.

: Significant Wave Period T_s = 6 sec.

Swell Waves : H = 4 ft.

Swell Wave Period T = 13 seconds

Direction: From 147°-236°T

Currents: See Table below

PRELIMINARY OPERATIONAL DESIGN CURRENT FOR THE HDWC PROGRAM CABLE LAYING VESSEL IN THE ALENUIHAHA CHANNEL

Depth Below Water Surface (ft)	Current (knots)
0	2.94
50	2.80
100	2.68
150	2.58
200	2.51
250	2.44
300	2.39
400	2.32
650	2.22
800	1.97
1000	1.65
1200	1.34
1300	1.2

D. Selection Criteria

Each proposal will be evaluated based on the following:

1) Ability of vessel to perform the cable laying operation safely in sea state specified.

2) Cost and cost sharing.

3) Ability to commit vessel for deployment in early 1985 (and cost of such commitment if any).

4) Other terms and conditions.

E. Schedule

Proposals are to be delivered to HD&C at 1580 Makaloa Street, Suite 840, Honolulu, Hawaii 96814, no later than 4:30 p.m. on May 6, 1983. HD&C will notify each proposer by May 15, 1983 regarding the results of its evaluation.

Please contact Mr. Frank McHale or Louis Lopez at (808)735-3276 for any clarification or other information required.

) : HAWAIIAN DREDGING AND CONSTRUCTION CO.
TTN : MR. FRANK MCHALE
ION : SANTA FE, EDINBURGH
EF : EDIN/AC/1573

JBJECT : HAWAII DEEP WATER CABLE
S.F.W.O. 452

N RESPONSE TO YOUR RECENT ENQUIRY DATED 21 APRIL 1983, SANTA FE
FFSHORE CONSTRUCTION COMPANY (CONTRACTOR) HAS REQUESTED WE SUBMIT
EREWITH THEIR BUDGET ESTIMATE FOR THE ABOVE REFERENCED WORK FOR YOUR
NSIDERATION.

ONTRACTOR PROPOSES TO UTILIZE THE SELF PROPELLED, DYNAMICALLY
OSITIONED REEL SHIP ''APACHE'' FOR PERFORMING THE WORK.

RIEF DESCRIPTION OF ''APACHE''

I. VESSEL DESCRIPTION

CLASS	-	A.B.S. A1
FLAG	-	UNITED STATES OF AMERICA
LENGTH	:	403 FT. 3 INS. OVERALL
BEAM	:	70 FT.
DEPTH	:	28 FT. 6 INS. TO MAIN DECK
DRAFT, OPERATING	:	18 FT. 2-1/2 INS.
SPEED, CRUISING	:	11. KNOTS.
SPEED, LAYING	:	2 KNOTS. (MAX)
MAIN PROPULSION, DIESEL	:	7,200 BHP
PROPELLERS	:	2 CONTROLLABLE PITCH
SHIPBOARD POWER	:	3 EACH 900 KW GENERATORS
BOW THRUSTERS	:	2 EACH 800 SHP
STERN THRUSTERS	:	2 EACH 800 SHP
THRUSTER POWER	:	3 EACH 900 KW GENERATORS
EMERGENCY POWER	:	1 EACH 250 KW GENERATORS
QUARTERS, AIR CONDITIONED	:	123 MEN (2 MAN CABINS)
HOSPITAL	:	6 MAN

DYNAMIC POSITIONING SYSTEM

THE APACHE IS EQUIPPED WITH A HONEYWELL/NORCONTROL DYNAMIC POSITIONING SYSTEM WHICH CONTROLS THE TWO VARIABLE PITCH MAIN PROPELLERS AND THE BOW AND STERN TUNNEL THRUSTERS. THE SYSTEM IS FULLY AUTOMATIC AND CAN BE PRE-PROGRAMMED TO FOLLOW ANY SPECIFIED LAY ROUTE OR TO HOLD ANY FIXED POSITION AND HEADING. THE SYSTEM CAN RECEIVE ITS POSITION REFERENCE FROM HONEYWELL RS 7 ACOUSTIC BEACONS, MOTOROLA MINI RANGER, ARTEMIS, SYLEDIS OR ANY OTHER CONVENTIONAL POSITION FIXING SYSTEM.

MOORING SYSTEM

APACHE IS EQUIPPED WITH A FOUR-POINT MOORING SYSTEM WHICH INCLUDES THE FOLLOWING:-

BOW ANCHORS	:	2 EACH 30,000 LBS.
STERN ANCHORS	:	2 EACH 20,000 LBS.
ANCHOR WINCHES	:	2 - INTERCONTINENTAL DOUBLE DRUM

REEL	:	FLANGE DIAMETER	82 FT.
		HUB DIAMETER	54 FT.
		WIDTH BETWEEN FLANGES	22 FT.
		WEIGHT CAPACITY	2000 S/TONS OF CABLE
STRAIGHTENER	:	ADJUSTABLE HYDRAULIC TRACK TYPE	
TENSIONER	:	1 80,000 LBS. CAPACITY SUPPLEMENTING REEL TENSION OF 200,000 LBS DEVELOPING A TOTAL TENSION OF 280,000 LBS.	
A + R WINCH	:	INTERCONTINENTAL 300,000 LBS. CAPACITY	

CRANES

CRAWLER	-	1 MANITOWOC 4100 WITH 90 FT. BOOM CAPACITIY 400,000 LBS.
PEDESTAL	-	2 SEAKING 2300 WITH 100 FT. BOOM CAPACITY 90,000 LBS.
DAVITS	-	4

NAVIGATION AND COMMUNICATION EQUIPMENT

THE APACHE IS FULLY EQUIPPED TO PERFORM ACCURATE NAVIGATION FUNCTIONS, AND HAS A FULL COMPLEMENT OF COMMUNICATIONS EQUIPMENT.

MAJOR SYSTEM INCLUDES:-

1	-	SPERRY MK37 GYROCOMPASS
2	-	RAYTHEON NO DE-420, X-BAND AND S-BAND RADARS
2	-	RAYTHEON DIGITAL AND WHITE LINE DEPTH SOUNDERS
2	-	ITT FULL SYNTHESIZED 25 WATT VHF-FM
1	-	ITT MRV - 29 B/35A SHIPBORNE COMMUNICATIONS CONSOLE FOR WORLD WIDE USE.
6	-	ITT VHF-FM 5 WATT ''WALKIE-TALKIE''
1	-	ITT EMERGENCY LIFEBOAT COMMUNICATIONS EQUIPMENT
1	-	ITT-ST-1610 COMMUNICATIONS PACKAGE FOR PUBLIC/ PRIVATE TELEX OPRTATION FOR WORLD WIDE USE
1	-	P.A. SYSTEM.
1	-	MARSAT SATTELITE COMMUNICATIONS SYSTEM.

MISCELLANEOUS EQUIPMENT

1	-	JET PUMP, 1,000 GPM 600 P.S.I.
2	-	AIR COMPRESSORS, 600 CFM 125 P.S.I.
2	-	WATER MAKERS, AQUACHEM 5-300
1	-	MACHINE SHOP EQUIPPED WITH A GENERAL PURPOSE LATHE, UNIVERSAL MILLING MACHINE, HYDRAULIC PRESS, POWER HACKSAW, DRILL PRESS, TOOL GRINDER.
1	-	ELECTRIC SHOP, EQUIPPED WITH OSCILLISCOPES, MULTI-METERS, WORKBENCHES, BATTERY CHARGERS, ETC.

FUEL CONSUMPTION

7,000 U.S. GALS/DAY	AVE. DURING TRANSIT OPERATIONS
5,000 U.S. GALS/DAY	AVE. DURING LAY OPERATIONS

ENVIRONMENTAL RECORDING

WIND SPEED, WIND DIRECTION AND VESSEL HEADING ARE CONTINOUSLY MONITORED BY THE HONEYWELL MICROASK SYSTEN.

WATER DEPTH BENEATH THE VESSEL IS CONTINOUSLY MONITORED BY A RAYTHEON ECHO SOUNDER AND IS RECORDED ON A GRAPH CHART.

---

1. SCOPE OF WORK

CONTRACTORS ESTIMATE IS BASED ON PERFORMING THE FOLLOWING ITENS OF WORK.

1.1. DESIGN AND MODIFICATIONS TO VESSEL (INCLUDING A.B.C.D. OF PARAGRAPH B.8 OF THE RFP)

1.2. MOBILIZATION/DEMOBILIZATION OF VESSEL TO/FROM U.S. EAST COAST PORT.

1.3. A. LOAD VESSEL WITH CABLE IN U.S. COAST PORT (7 DAY ALLOWANCE)
B. TRANSIT VIA PANAMA CANAL TO HAWAII.
C. DEMONSTRATION AT JOB SITE (3.5 DAY ALLOWANCE)
(BUDGET ESTIMATE DAYRATE DURING CABLE LAYING PHASE
U.S.D. 80,000 ,PERFORMANCE OF DEMONSTRATION BETWEEN 1 JAN - 15 FEB 1985
U.S.D. 115,000 PERFORMANCE OF DEMONSTRATION IN 1985 BUT AFTER 15 FEB.
D. RETURN TO U.S. COAST PORT TO OFFLOAD CABLE.
E. REMOVE CABLE (7 DAY ALLOWANCE).

2. BUDGET ESTIMATE PRICES - ALL PRICES IN U.S. DOLLARS

2.1 ESTIMATE BASED UPON PERFORMANCE OF THE DEMONSTRATION OFFSHORE HAWAII DURING THE TIME FRAME OF 1 JANUARY 1985 TO 15 FEBRUARY 1985.

SCOPE OF WORK REF	ITEM	ESTIMATE
1.1	DESIGN AND MODIFICATIONS	300,000
1.2.	MOBILIZATION/DEMOBILIZATION	1,335,000
1.3.(A,B,C,D,E)	SCOPE OF WORK	2,930,000
	ESTIMATE TOTAL USD	4,565,000

.2 ESTIMATE BASED UPON PERFORMANCE OF THE DEMONSTRATION OFFSHORE ~~HAWAII DURING 1985 BUT OCCURING AFTER FEBRUARY 15.~~
(NOTE : INCREASED RATES ARE DUE TO DEMONSTRATION AND SUBSEQUENT DEMOBILIZATION OCCURING DURING SEASONALLY PRIME OFFSHORE INSTALLATION MONTHS)

SCOPE OF WORK REF	ITEM	ESTIMATE
1.1	DESIGN AND MODIFICATION	300,000
1.2	MOBILIZATION/DEMOBILIZATION	3,485,000
1.3.(A,B,C,D,E)	SCOPE OF WORK	7,640,000
	ESTIMATE TOTAL USD	11,425,000

QUALIFICATIONS/ASSUMPTIONS

THE FOLLOWING ASSUMPTIONS HAVE BEEN MADE IN PREPARING OUR BUDGET ESTIMATE:

3.1. INCLUDED IN THE ESTIMATE ARE:-
- MANAGEMENT CO-ORDINATION
- CREW COSTS
- FUEL, LUBE OIL AND APACHE CONSUMABLES
- INSURANCE COVERAGE DURING THE PERFORMANCE OF THE WORK CONSISTING OF:-
  A) ALL MACHINERY FOR CONTRACTORS EQUIPMENT
  B) WORKMAN'S COMPENSATION
  C) GENERAL LIABILITY (LIMIT OF 1,000,000 U.S. DOLLARS)

3.2. EXCLUDED FROM THE ESTIMATE ARE:-
- CABLE AND CLIENTS EQUIPMENT
- COSTS ASSOCIATED WITH CABLE HANDLING ONSHORE
- SURVEYORS AND SURVEY EQUIPMENT TO POSITION VESSEL ON SITE.
- BATHYMETRICAL SURVEYS.
- UNDERWATER RIGGING, DIVING SERVICES
- INSPECTION OF CABLE

CAPABILITIES OF APACHE

AFTER MODIFICATIONS OF APACHE

MAXIMUM CONDITIONS OF CABLE WEIGHT, LENGTH OF LOADS THAT CAN BE HANDLED AFTER MODIFICATIONS AS PER PARAGRAPH B.6 OF RFP ARE:

1. LOW CABLE WEIGHT (21 LB-FT) - 36 STATUTE MILES
2. MODERATE CABLE WEIGHT (31 LB-FT)- 24 STATUTE MILES
3. HIGH CABLE WEIGHT (41 LB-FT) - 18 STATUTE MILES

CONTRACTOR CONFIRMS THE ABILITY TO PERFORM IN CONDITIONS AS STATED IN PARAGRAPH C OF THE RFP.

NOTES:

ESTIMATE IS BASED UPON THE PERFORMANCE OF THE DEMONSTRATION OFFSHORE HAWAII DURING THE TIME FRAME OF 1 JANUARY 1985 TO 15 FEBRUARY 1985.

CONTRACTOR CURRENTLY HAS NO PRIOR COMMITTMENTS FOR THE PROPOSED WORK PERIOD. PERFORMANCE OF WORK IS CONTINGENT UPON EXECUTION OF A CONTRACT CONFIRMING MUTUALLY AGREEABLE TERMS AND CONDITIONS AND SUBJECT TO THE AVAILABILITY OF EQUIPMENT.

WE HOPE THIS BUDGET ESTIMATE MEETS WITH YOUR APPROVAL AND WE WOULD BE PLEASED TO MEET YOUR REPRESENTATIVES AT YOUR EARLIEST CONVENIENCE TO PROVIDE ANY ADDITIONAL INFORMATION WHICH MAY BE REQUIRED IN CONNECTION WITH OUR ESTIMATE. WE LOOK FORWARD TO THE OPPORTUNITY OF WORKING WITH HAWAIIAN DREDGING ON THIS PROJECT.
REGARDS,

LESTER H. ARBO
AREA MANAGER
SANTA FE (UK) LTD

PIRELLI
CABLE CORPORATION

PROPOSAL FOR THE

HAWAII DEEP WATER CABLE DEMONSTRATION PROGRAM

CABLE LAYING EQUIPMENT AND VESSEL

1.0 Introduction

This proposal is in response to Hawaiian Dredging and Construction Company's letter dated April 21, 1983, "Hawaii Deep Water Cable Demonstration Program."

The Pirelli Group holds a leading position in the design, development, manufacture and installation of power submarine cables throughout the world. Presently we are working with Dillingham Corporation Canada Limited on the installation of the 500 kV A.C. cables at Vancouver, Alberta-British Columbia, Canada and we would be most pleased to work with Hawaiian Dredging and Construction Company on this extremely important and interesting program.

The successful performance of high voltage submarine cables, particularly in deep waters is dependent upon not only the proper design and manufacture of the cable but on the proper installation equipment and techniques. Laying submarine cables is a complex and difficult operation, requiring expert technical and installation supervision to coordinate all of the various aspects of the work. Traditionally, to guarantee reliable performance of the complete cable system, the Pirelli Group acts as the prime contractor with total responsibility for the installation.

Recognizing Hawaiian Dredging and Construction Company's key role in the HDWC demonstration program and its expertise in Hawaiian waters, Pirelli is pleased to submit the following proposal. It should be recognized however, that due to the short time available to research and prepare this proposal, our proposal should be considered as a preliminary one, subject to further discussions and confirmation when more data and information is made available to us. At that time, the responsible parties should be prepared to discuss, negotiate, and agree as to how the project should be structured to best satisfy the needs of the program. Therefore, we are available to discuss any and all aspects of our proposal and of the program at your convenience.

PIRELLI
CABLE CORPORATION

2.0 PROPOSAL

2.1 GENERAL

Pirelli has been active in the design of deep water cables and has recently submitted a proposal to Parsons Hawaii for Cable Design Development Work for the Hawaii Deep Water Cable Program. Based on our experience and our present knowledge of the program, we have taken the "moderate" values of Section C of the Request For Proposal to develop our proposal strategy. The values listed in the "High" column would appear to be in excess of what we believe will be required.

Considering that the weight of 175 miles of submarine cable for use in the open ocean waters from the Island of Hawaii to the Island of Oahu in the Hawaiian chain would be in the order of 13,000 metric tons and that such cable must be laid from a turntable on the cable laying vessel, Pirelli would concur that no vessel currently has the capability of handling the loads envisioned for the HDWC project. The SKAGERRAK, which is the largest cable laying ship with a turntable presently available, has a maximum load handling capability of 7,000 metric tons.

While it is considered that the cable laying equipment required for the actual cable installation must be that which is to be used for the sea trial, a smaller cable laying vessel could be used. The primary purpose of the sea trial is to

- perform a seakeeping study under actual conditions in Hawaiian waters

- check the actual cable laying equipment

- check the laying procedure and perform a dynamic analysis of the cable during laying

- confirm the suitability of the cable design

Therefore, use of the actual cable laying equipment on a smaller, suitable cable laying vessel will not only meet the criteria of the sea trial but would present considerable cost savings. Smaller cable laying vessels are already existing and the transfer of the cable laying equipment to the final cable laying ship in the future would be easily accomplished.

2.2 POTENTIAL VESSELS FOR THE SEA TRIAL

Following are brief descriptions of five potential cable laying vessels for the sea trial with our preliminary comments.

2.2.1 SUSITNA

Owner: CHUGACH Electric Association, Anchorage (Alaska)

Turntable: External diameter: 9 meters
Maximum load: 300 tons

Technical comment: the SUSITNA is capable of performing the cable laying and retrieval in the sea state specified in section C of the RFP. The vessel requires two tugs, one for towing and one for assistance.

Availability: To be investigated

Daily Rate including tugs: Operation $73,000
Stand-by $65,000

2.2.2 H.P. LADING

Owner: N.K.T., Copenhagen (Denmark)

Turntable: External diameter: 19.5 meters
Maximum load: 1450 tons

Technical comment: The H.P. LADING is capable of performing the cable laying and retrieval in the sea state specified in section C of the RFP. This vessel is self-propelled and therefore requires only one assistance tug.

Availability: to be investigated

Daily Rate including tug: Operation $30,000
Stand-by $27,000

2.2.3 APACHE

Owner: SANTA FE' INTERNATIONAL CORP, USA

Turntable (verticle): external diameter: 25 meters
maximum load: 1815 tons

Technical comment: The APACHE is capable of performing the cable laying and retrieval in the sea state specified in section C of the RFP. This vessel is self-propelled, and has controllable pitch bow and stern thrusters.

Availability: to be investigated

Daily Rate: Operation $151,000
Stand-by $145,000

2.2.4 A.D.7

Owner: SADAR INCOP, Ancona (Italy)

Turntable: External diameter: 13 meters
Maximum load: 400 tons

Technical comment: The A.D.7 is capable of performing the cable laying and retrieval in the sea state specified in section C of the RFP. The vessel requires two tugs, one for towing and one for assistance.

Availability: to be investigated

Daily Rate including tugs: Operation $23,000
Stand-by $21,000

2.2.5 SKAGERRAK

Owner: NORWEGIAN ELECTRICITY BOARD, Oslo (Norway)

Turntable: External diameter: 29 meters
Maximum load: 7,000 tons

Technical comment: The SKAGERRAK is capable of performing the cable laying and retrieval in the sea state specified in section C of the RFP. The vessel is self-propelled and has dynamic positioning.

Availability: to be investigated

Daily Rate: Operation $50,000
Stand-by $45,000

2.3 COST

Pirelli is a leading designer, manufacturer and installer of submarine cable systems throughout the world. However, inasmuch as Pirelli is not an owner of the previously listed cable laying vessels and due to the limited time available to prepare and submit our proposal, the costs presented herein are based on our extensive previous marine operations and do not reflect actual quotations for the items involved. Pirelli is at the disposal of Hawaiian Dredging and Construction Company to further discuss and negotiate a fixed price contract for the services required for a successful program.

2.3.1 LAYING EQUIPMENT

Design, procurement, fabrication, testing lump sum everything included: $3,500,000

2.3.2 EQUIPMENT AND VESSEL TESTING (included in 2.3.1 above)

2.3.3 EQUIPMENT REMOVAL AND RECONVERSION, if any (included in 2.3.4)

2.3.4 VESSEL TRANSIT, RIGGING AND UNRIGGING

This cost is a function of the type and home location of the vessel. In the development of our proposal we have also assumed that

- The manufacture of the laying equipment and the rigging of the vessels would be carried out close to their relevant home locations.

- the cable would be loaded as per section B 8 e of the RFP. East Coast. No cable transportation cost is foreseen.

- transit is from US East Coast to Honolulu.

- tugs, if any, to be rented at sea-trial site.

- at sea deployment as per section B 8 h of the RFP.

- daily rates as in 2.2.

- weather contingencies are excluded from our quotations.

- SUSITNA	:	approx.	$13,000,000.
- H. P. LADING	:	approx.	8,000,000.
- APACHE	:	approx.	20,000,000.
- A.D. 7	:	approx.	5,000,000.
- SKAGERRAK	:	approx.	10,000,000.

2.3.5 OTHER VESSELS REQUIRED FOR LOGISTIC SUPPORT

Assistance boats, as required during the sea-trial: $7,000/day
This item is included in the lump sum in item 2.3.4.

2.3.6 CREW COST

Included in vessel's daily rate.
Skilled cable personnel and cable handlers involved in rigging, unrigging and sea-trial performance: $12,000/day. This item is included in item 2.3.4.

2.3.7 OTHER SERVICES

Radio navigation system: $6,000/day.
Local agency services, local personnel transportation, licenses, work permits etc.: $150,000. Not included in 2.3.4.

PIRELLI
CABLE CORPORATION

2.4 TIME SCHEDULE

(rough evaluation)

1) Design, procurement, fabrication, testing of laying equipment: 14 months.

2) Vessel transit: from 5 to 7 months, plus an approximate dead time of 3-4 months depending upon the choice of vessels.

2.5 LOCATION

The work will be coordinated by Pirelli Cable Corporation from the headquarters at Union, New Jersey in close association with our Affiliates in the Pirelli Group. The location of the manufacture of equipment and vessel modification is a function of which vessel is chosen for the program.

2.6 PRELIMINARY RECOMMENDATIONS

Based on our discussions in section 2.1 GENERAL and the basis of the RFP, wherein it is stated that "the vessel provided for the demonstration test is not necessarily required to be the vessel used for laying the full length operational cable....It is desired that the equipment developed for the demonstration test be applicable to the commercial operation." Pirelli, for economical and technical reasons, recommends that consideration be given to the use of A.D. 7 for the cable laying vessel.

HOCCOH 7431879
-...10

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2056 EST
HOCCOH 7431879

TJ186 IN 05/20:53 OUT 05/20:57
HANK YOU
HUGACH AHG

HUGACH AHG

HUGACH AHG
TTN: FRANK MCHALE
I RESPONSE TO YOUR LETTER DATED APRIL 21, 1DIEN WE DO NOT HAVE
IE RESOURCES OR THE STAFF TO RESPOND TO YOUR RFP AS A TURN KEY
IR THIS PROJECT.

DO HOWEVER, HAVE A BARGE WE FEEL WOULD BE SUITABLE FOR THIS
ERATION, AND WOULD CONSIDER MAKING THE NECESSARY MODIFICATIONS
MEET YOUR REQUIREMENTS ON A REIMBURSABLE BASIS. WE WOULD ALSO
HAPPY TO ESTABLISH LEASE RATES ACCORDING TO THOSE PHASES AND
E VARIOUS USIGES OF THE BARGE THROUGHOUT THE PROJECT.

YOU WOULD BE INTERESTED IN AN ARRANGEMENT OF THIS TYPE, PLEASE
NTACT CHUGACH ELECTRIC, ATTENTION ERIC HAEHER.

ARDS,

RY BURGESS
GACH ELECTRIC
-265

RECEIVED
MAY - 5 1989
PROGRAM MANAGEMENT DIVISION

APPENDIX F